TD3300 Three Phase Multi-function Standard Meter

1. Summary

TD3300 is a high-precision three phase standard instrument, which can simultaneously measure multiple electrical quantities in the circuit such as: voltage, current, frequency, phase, harmonics, active power/ Electric energy, reactive power/electric energy, apparent power, power factor, etc.

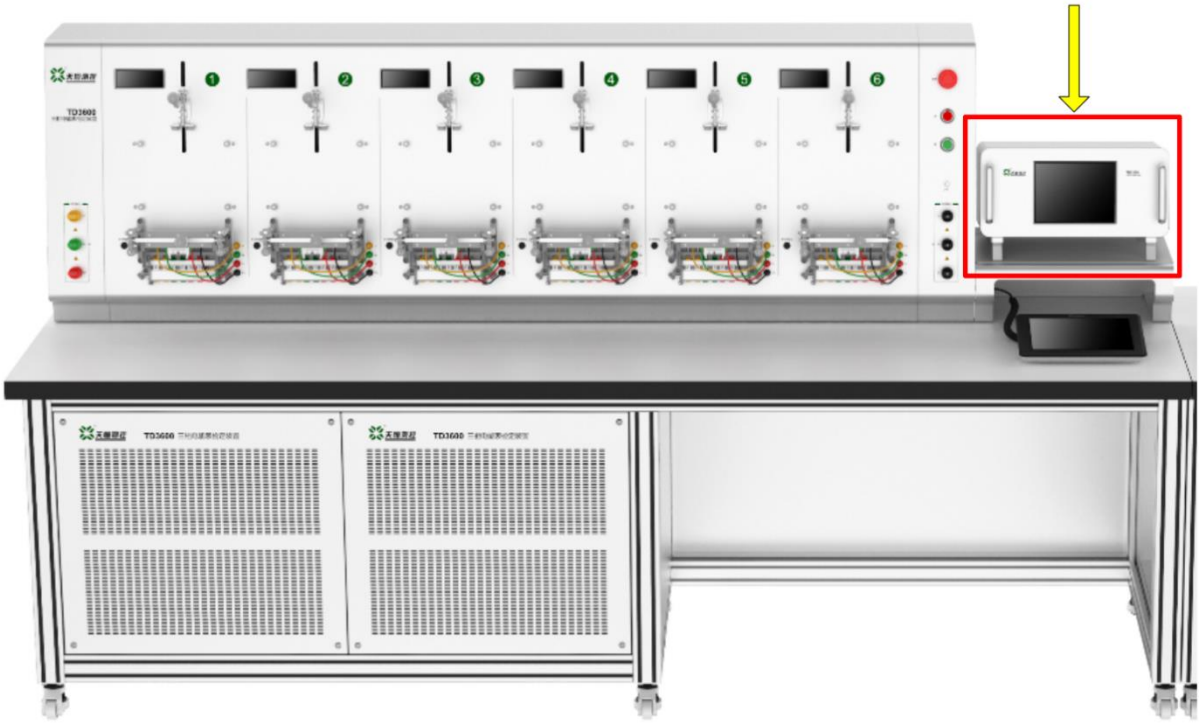
2. Features

- Power/energy Accuracy: Class **0.02**, Class **0.05 (optional)**
- Voltage measurement: 6 V～528 V (wider range can be customized).
- Current measurement：0.2 mA～120 A.
- Fundamental frequency: 45 Hz ~ 65 Hz (400Hz optional).
- The phase measurement uncertainty reaches 0.006° (class 0.02).
- Voltage and current support fully automatic range shifting.
- Voltage and current support 2~63th harmonic measurement.
- Support comprehensive statistical analysis of the measured electricity.
- Supports phasor diagram, spectrum diagram, trend diagram and other graphic displays.
- Standard energy pulse input/output function.
- Electrical isolation between measurement circuits, high reliability.
- USB, RS232, and LAN interfaces.
- LCD touch screen.

3. Applications

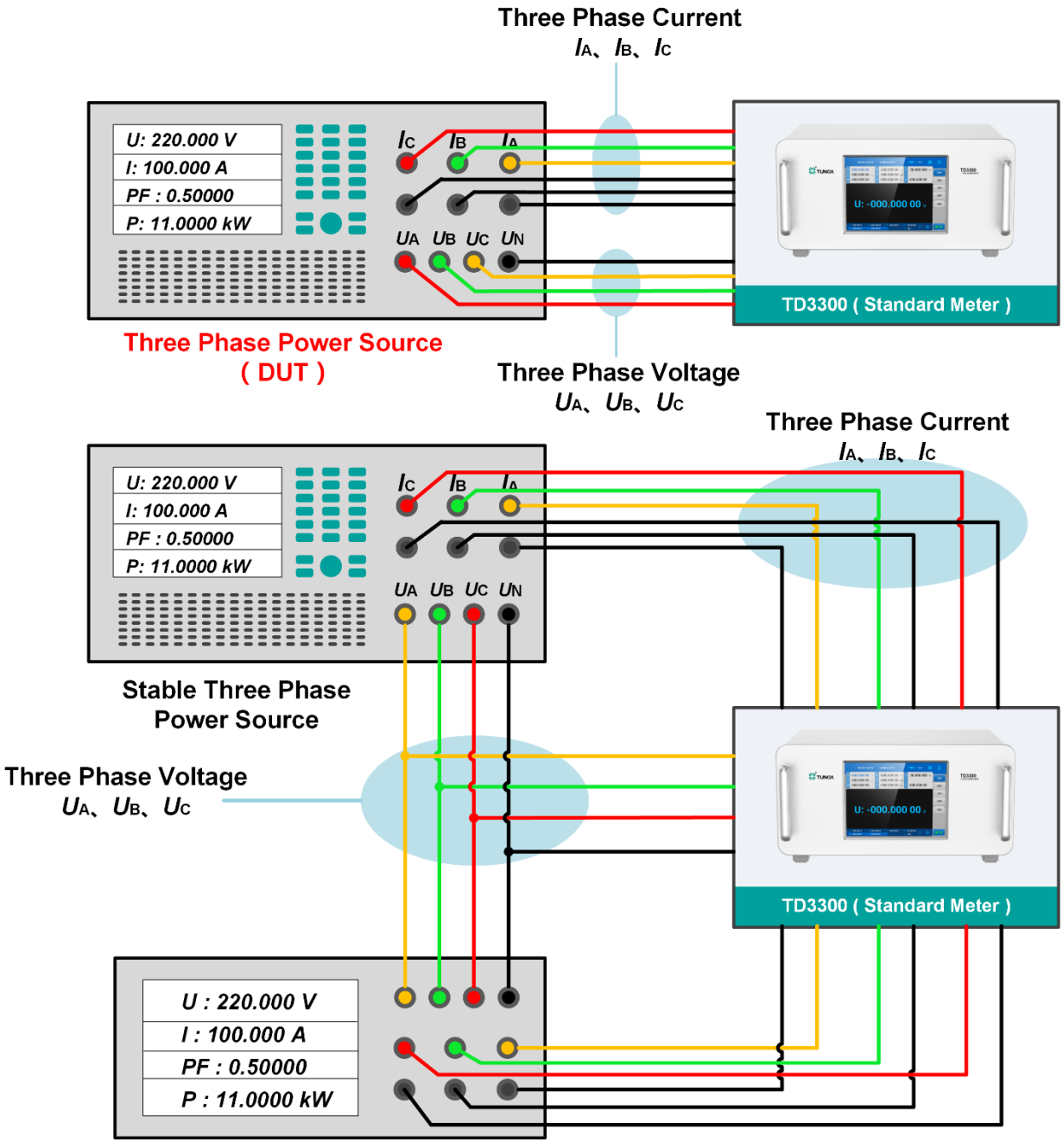
☆Standard Meter for AC Energy Meter Calibration Device

As a standard energy meter for the calibration of class 0.02 / class0.05 R46 AC energy meter testing equipment.



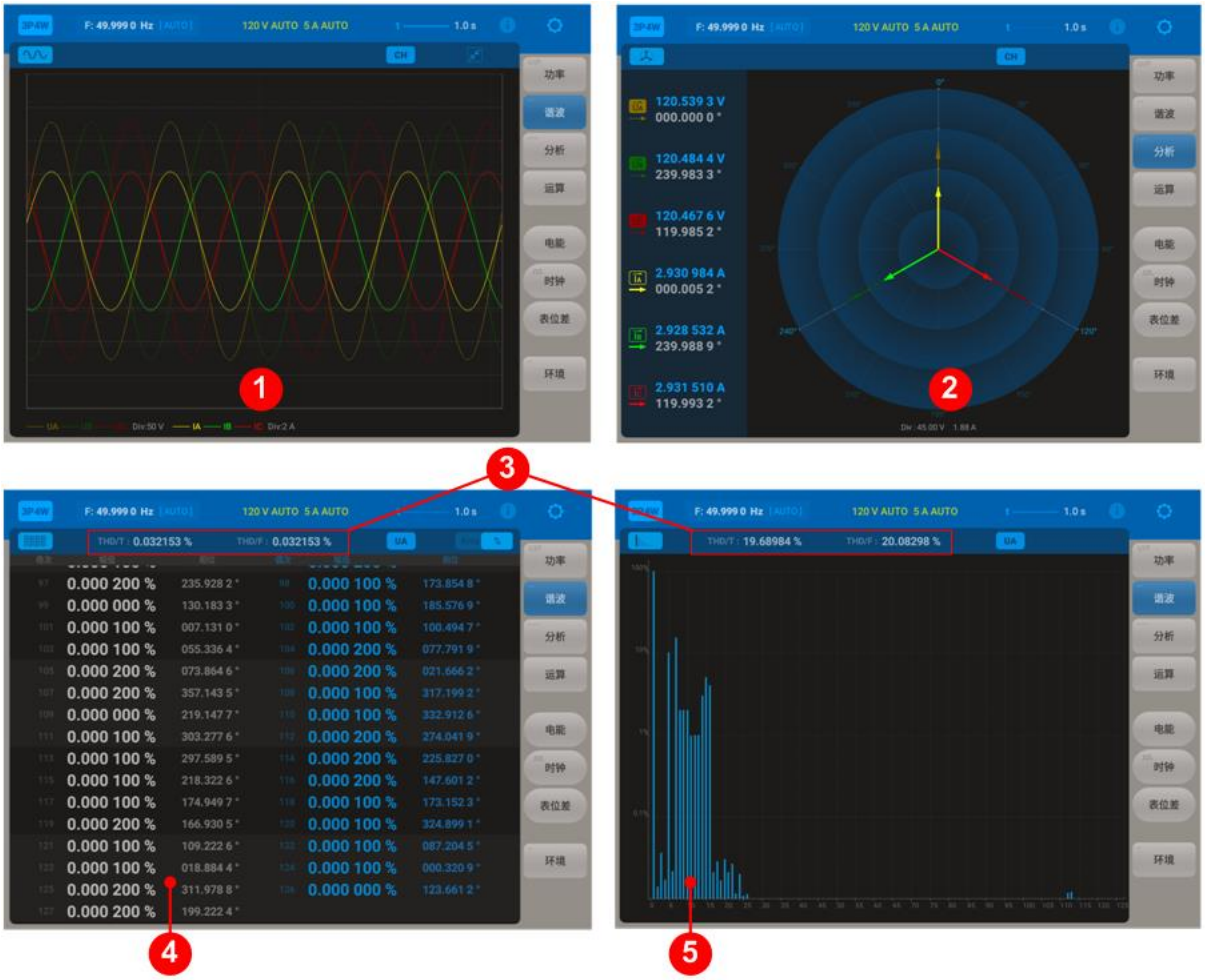
- Can be used as a standard meter for AC energy meter calibration devices that meet the requirements of R46.

☆Calibrate Single /Three Phase Power Source or Meter



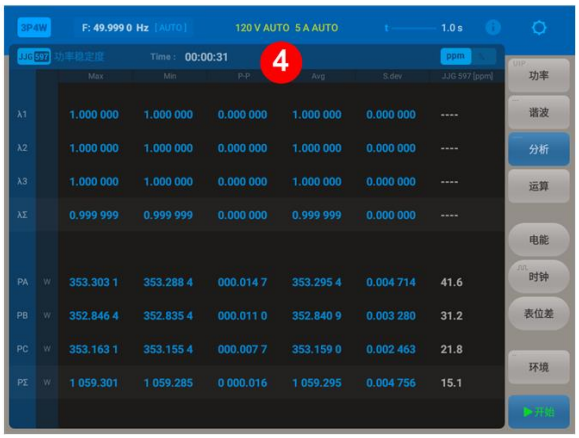
- Suitable for calibrating single/three phase standard voltage sources and standard voltmeters of class 0.05 and below (with stable voltage source).
- Suitable for calibrating single/three phase standard current sources and standard ammeters of class 0.05 and below (with stable current source).
- Suitable for calibrating single/three phase power sources, power meters, standard energy meters of class 0.05 and below (with stable power source).

☆Comprehensive Analysis of AC Power



S/N	Function
1	The measuring channel has the function of oscilloscope, which can display the waveform of the measured power in real time.
2	Accurately measure the phase between the voltage and current of each phase, and visually display it through the form of phasor diagram.
3	Two types of harmonic distortion, THD/T (harmonic relative to full wave) and THD/F (harmonic relative to fundamental wave), are calculated.
4	The amplitude (RMS), content (%) and phase of the 2nd ~ 63th harmonic wave of each phase voltage or current can be analyzed in real time.; It is used to check whether the harmonic content and phase of complex waveform output of R46 device meet the requirements of the regulation.
5	The spectrum of each harmonic is visually displayed in the form of a bar chart (the fundamental wave is 100%).

☆Data Statistical Analysis Function



S/N	Function
1	**Statistical Analysis of Data:** calculate the maximum value (Max), minimum value (Min), peak-peak value (P-P), average value (Avg), standard variance (S.dev), etc.
2	**Power Stability Test:** In the test cycle, real-time plot the curve of power change with time.
3	**Normal Distribution Histogram:** Displays the distribution of the collected power within a test period.
4	**Power Stability Test:** the output power stability of the inspected electric energy device can be calculated automatically.

4. Specifications

4.1 Three phase Voltage Measurement

Range	Resolution	Measurement Uncertainty (k = 2) (ppm*RD + ppm*RG) [1]		Temperature Coefficient @ (15~30)°C (ppm*RD+ppm*RG) /°C	
		Class 0.05	Class 0.02	Class 0.05	Class 0.02
60 V	10 μV	200 + 50	60 + 40	< 10	0.5 + 0.5
120 V	0.1mV	200 + 50	60 + 40	< 10	0.5 + 0.5
240 V	0.1mV	200 + 50	60 + 40	< 10	0.5 + 0.5
480 V	0.1mV	200 + 50	60 + 40	< 10	0.5 + 0.5
Note [1]: RD is the reading value, RG is the range value, the same below.					

- Measuring range: 6 V~528 V (wider range can be customized), 7-digit display, manual/automatic range shifting

4.2 Three phase Current Measurement

Class 0.02					
Range	Resolution	Measurement Uncertainty at different frequency (k = 2) (ppm*RD + ppm*RG)			Temperature Coefficient @ (15~30)°C (ppm*RD+ppm*RG) /°C
		45 ≤ F ≤ 65	65 < F ≤ 200	200 < F ≤ 400	
5 mA	1 nA	240 + 160	480 + 320	1000 + 600	10 + 10
10 mA	10 nA	120 + 80	240 + 160	480 + 320	5 + 5
20 mA	10 nA	120 + 80	240 + 160	480 + 320	1.25 + 1.25
50 mA	10 nA	60 + 40	120 + 80	240 +160	0.5 + 0.5
100 mA	0.1 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5
200 mA	0.1 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5
500 mA	0.1 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5
1 A	1 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5
2 A	1 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5
5 A	1 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5
10 A	10 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5

20 A	10 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5
50 A	10 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5
100 A	100 μA	60 + 40	120 + 80	240 +160	0.5 + 0.5

- Measuring range: 0.2 mA~120 A, 7-digit display, manual/automatic range shifting.

Class 0.05					
Range	Resolution	Measurement Uncertainty at different frequency (k = 2) (ppm*RD + ppm*RG)			Temperature Coefficient @ (15~30)°C (ppm*RD+ppm*RG) /°C
		45 ≤ F ≤ 65	65 < F ≤ 200	200 < F ≤ 400	
5 mA	1 nA	400 + 300	800 + 600	1600 + 1200	< 30
10 mA	10 nA	300 + 200	600 + 400	1200 + 800	< 30
20 mA	10 nA	300 + 200	600 + 400	1200 + 800	< 10
50 mA	10 nA	200 + 50	400 + 100	800 + 200	< 10
100 mA	0.1 μA	200 + 50	400 + 100	800 + 200	< 10
200 mA	0.1 μA	200 + 50	400 + 100	800 + 200	< 10
500 mA	0.1 μA	200 + 50	400 + 100	800 + 200	< 10
1 A	1 μA	200 + 50	400 + 100	800 + 200	< 10
2 A	1 μA	200 + 50	400 + 100	800 + 200	< 10
5 A	1 μA	200 + 50	400 + 100	800 + 200	< 10
10 A	10 μA	200 + 50	400 + 100	800 + 200	< 10
20 A	10 μA	200 + 50	400 + 100	800 + 200	< 10
50 A	10 μA	200 + 50	400 + 100	800 + 200	< 10
100 A	100 μA	200 + 50	400 + 100	800 + 200	< 10

- Measuring range: 0.2 mA~120 A, 7-digit display, manual/automatic range shifting.

4.3 Frequency/Phase Measurement

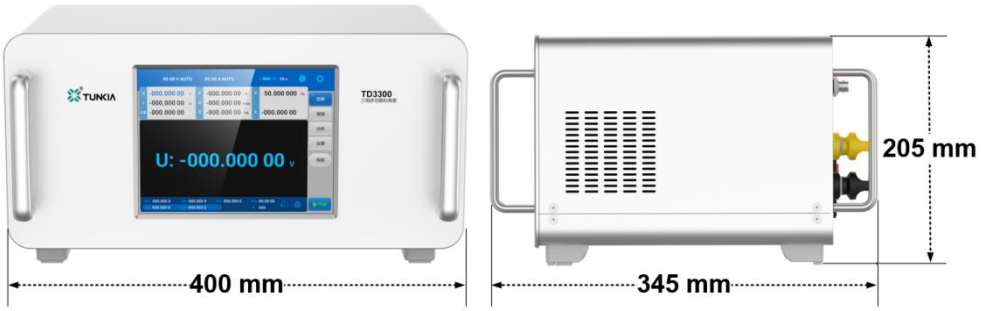
Class 0.02				
Measurement Type			**TD3300**	**TD3300-R**
Frequency	Measuring Range		45 Hz～65 Hz	45 Hz～400 Hz
	Minimum Resolution		0.000 01 Hz	0.000 01 Hz
	Measurement Uncertainty (k=2)		0.005%*RD	0.005%*RD
Phase	Measuring Range		0～360°（I ≥ 50mA）	0～360°（I ≥ 50mA）
	Minimum Resolution		0.000 1°	0.000 1°
	Measurement Uncertainty (k=2)	45 Hz ≤ F ≤ 65 Hz	0.006°	0.006°
		65 Hz < F ≤ 200 Hz	——	0.02°
		200 Hz < F ≤ 400 Hz	——	0.04°
Class 0.05				
Measurement Type			**TD3300**	**TD3300-R**
Frequency	Measuring Range		45 Hz～65 Hz	45 Hz～400 Hz
	Minimum Resolution		0.000 01 Hz	0.000 01 Hz
	Measurement Uncertainty (k=2)		0.005%*RD	0.005%*RD
Phase	Measuring Range		0～360°（I ≥ 50mA）	0～360°（I ≥ 50mA）
	Minimum Resolution		0.000 1°	0.000 1°
	Measurement Uncertainty (k=2)	45 Hz ≤ F ≤ 65 Hz	0.012°	0.012°
		65 Hz < F ≤ 200 Hz	——	0.04°
		200 Hz < F ≤ 400 Hz	——	0.08°

4.4 Power / Energy Measurement（30 V ≤ U ≤ 480 V）

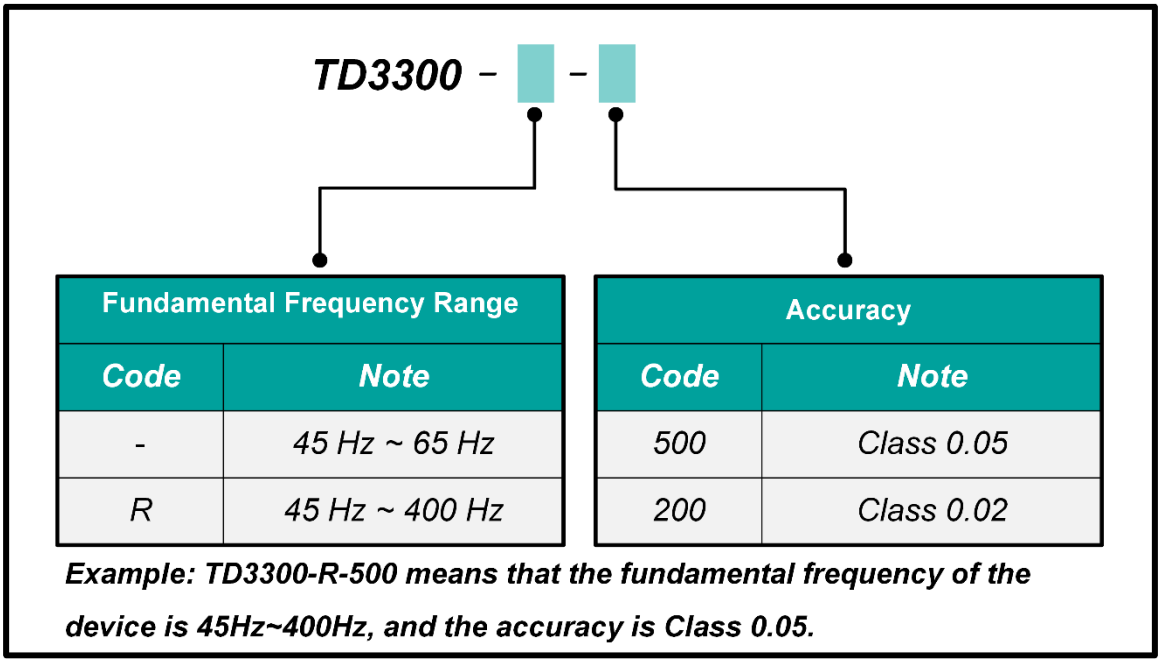
Class 0.02					
Voltage Range	Current Range	Factor	Measurement Uncertainty at different frequencies (Hz) (k=2)		
			45 ≤ F ≤ 65	65 < F ≤ 200	200 < F ≤ 400
30 V ≤ U ≤ 480 V	50 mA ≤ I ≤120 A	0.5L~1~0.5C	0.02%*RD	0.04%*RD	0.08%*RD
	10 mA ≤ I < 50 mA	1	0.02%*RD	0.06%*RD	0.16%*RD
		0.5L~1~0.5C	0.04%*RD		
	3 mA ≤ I < 10 mA	1	0.04%*RD	-	-
		0.5L~1~0.5C	0.08%*RD	-	-
	0.2 mA ≤ I < 3 mA	1	0.04%*RD×3mA/I	-	-
Class 0.05					
Voltage Range	Current Range	Factor	Measurement Uncertainty at different frequencies (k=2)		
			45 ≤ F ≤ 65	65 < F ≤ 200	200 < F ≤ 400
30 V ≤ U ≤ 480 V	50 mA ≤ I ≤120 A	0.5L~1~0.5C	0.05%*RD	0.1%*RD	0.2%*RD
	10 mA ≤ I < 50 mA	1	0.05%*RD	0.12%*RD	0.32%*RD
		0.5L~1~0.5C	0.08%*RD		
	3 mA ≤ I < 10 mA	1	0.08%*RD	-	-
		0.5L~1~0.5C	0.15%*RD	-	-
	0.2 mA ≤ I < 3 mA	1	0.08%*RD×3mA/I	-	-

- Power/energy measurement range: a combination of AC voltage range and AC current range
- Power factor measurement range: -1.000 000... 0.000 000... 1.000 000
- Standard energy pulse output: 60 kHz for high-frequency full-scale values and 6 Hz for low-frequency full-scale values
- Standard energy pulse input: frequency≤ 200 kHz, voltage: 0... 3.3 V... 24 V

5. General Specifications

Power Supply	AC (220 ± 22) V，(50 ± 2) Hz
Maximum Power Consumption	60 VA
Warm-up Time	30mins
Temperature Performance	Working temperature: 5°C~45°C； Storage temperature: -10°C~55°C
Humidity Performance	Operating humidity: < 80% @ 30°C，< 70% @ 40°C，< 40% @ 50°C Storage humidity: (20%~80%) R·H，no condensation.
Altitude	< 3000 m
Quality	Approx.10.1 kg
Communication Interface	RS232、USB、LAN
Size	400 mm(W) × 345 mm(D) × 206 mm(H) (Includes handles and feet)
	

6. Ordering Information



Fundamental Frequency Range	
Code	Note
-	45 Hz ~ 65 Hz
R	45 Hz ~ 400 Hz

Accuracy	
Code	Note
500	Class 0.05
200	Class 0.02

Example: TD3300-R-500 means that the fundamental frequency of the device is 45Hz~400Hz, and the accuracy is Class 0.05.

7. Accessories List

S/N	Picture	Name	Specification	Quantity	Note
1		Voltage Combination Test Leads	3m/1.6mm^2/Φ4 Socket-Φ4 Socket	Yellow 1 Green 1 Red 1 Black 1	Standard Accessory
2		10A Current Test Leads	3m/2.1mm^2/Φ4 Socket - Φ4 Socket	Yellow 1 Green 1 Red 1 Black 3	Standard Accessory
3		20A Current Test Leads	1.5m/6mm^2/Φ4 Socket - Φ4 Socket	Yellow 1 Green 1 Red 1 Black 3	Standard Accessory
4		100A Current Test Leads	1.5m/25mm^2/Φ12 Socket -Φ12 Socket	Yellow 1 Green 1 Red 1 Black 3	Standard Accessory
5		U-shaped Insert	Φ8 Thin Insert /Φ4 Jack	Yellow 2 Green 2 Red 2 Black 6	Standard Accessory
6		Power Cable	AC 220V、10A	1	Standard Accessory
7		Glass Fuse	F3A、250V	3	Standard Accessory
8		Electric Energy Pulse Signal Line	1.5 M / BNC Male - Alligator Clip Two Wires	1	Standard Accessory
9		Signal Test Leads	1.5 m / BNC Male- BNC Male	1	Standard Accessory
10		Case	Carton	1	Standard Accessory

S/N	Picture	Name	Specification	Quantity	Note
1		Aluminum Alloy Case	Aluminum alloy	1	Case Optional Accessories
2		Portable Case	Waterproof, shockproof, antistatic	1	

Note: The above accessories need to be purchased separately and specified in the order contract.